Kirtland Air Force Base Fuel Spill Cleanup

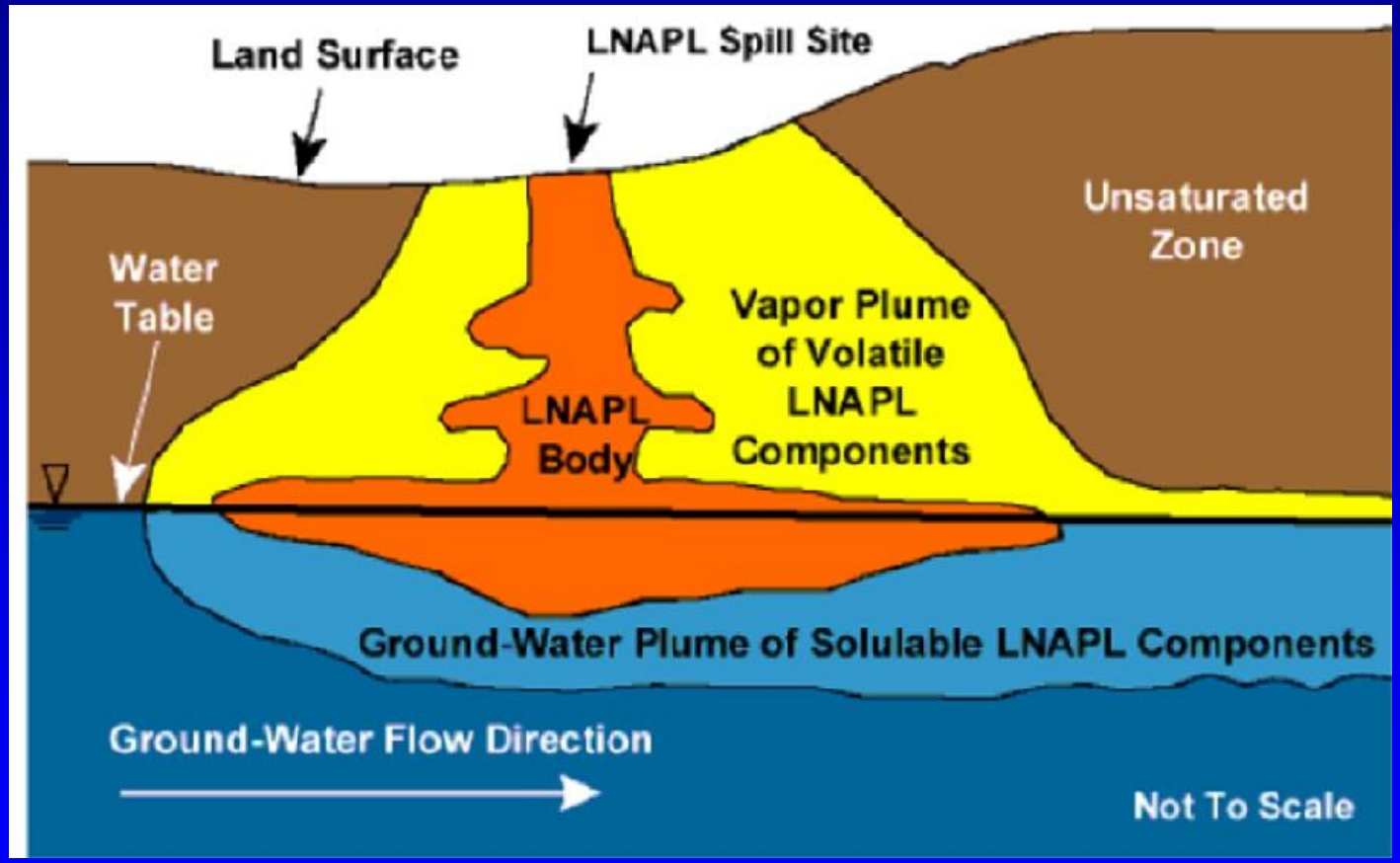
New Mexico Environment Department

July 2, 2014

Site History

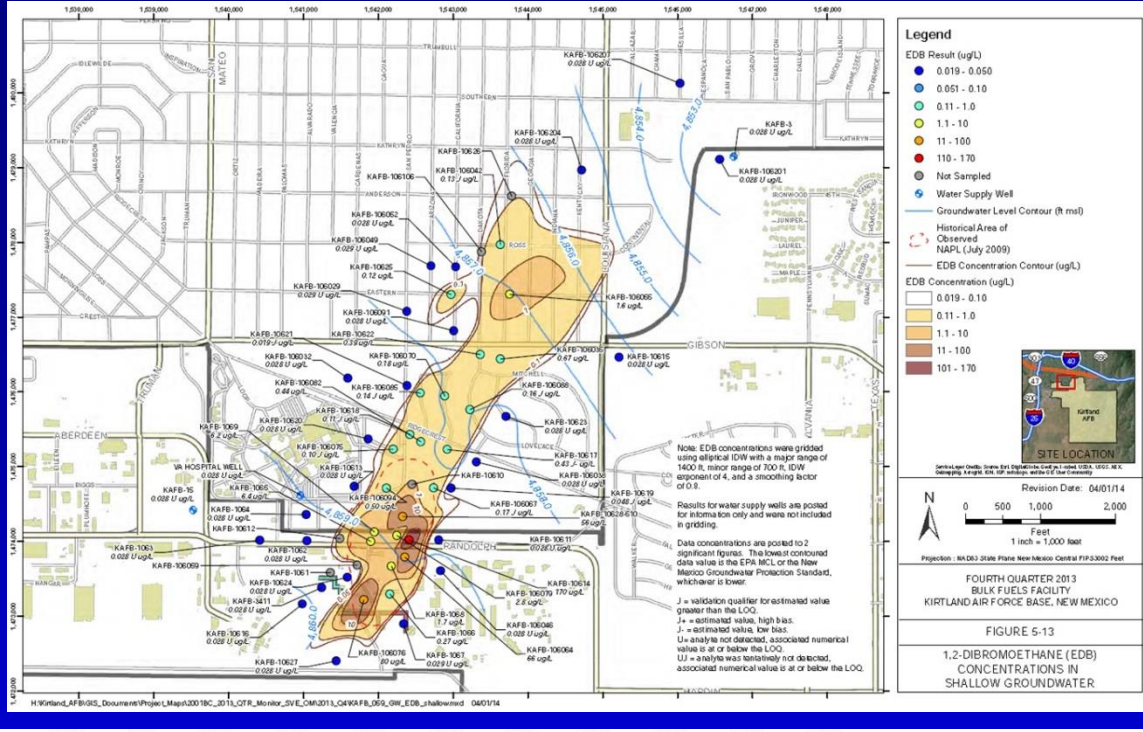
- 1953 – Bulk Fuels Facility constructed
- 1999 – U.S. Air Force notified NMED of soil contamination
- 2001 – U.S. Air Force notified NMED of groundwater contamination with dissolved fuel constituents
- 2007 – Fuel discovered floating on groundwater (light non-aqueous phase liquid, LNAPL)
- 2014 – 500,000 gallons of fuel has been recovered by soil vapor extraction (SVE)

Hydrocarbon Fuel Migration in the Subsurface

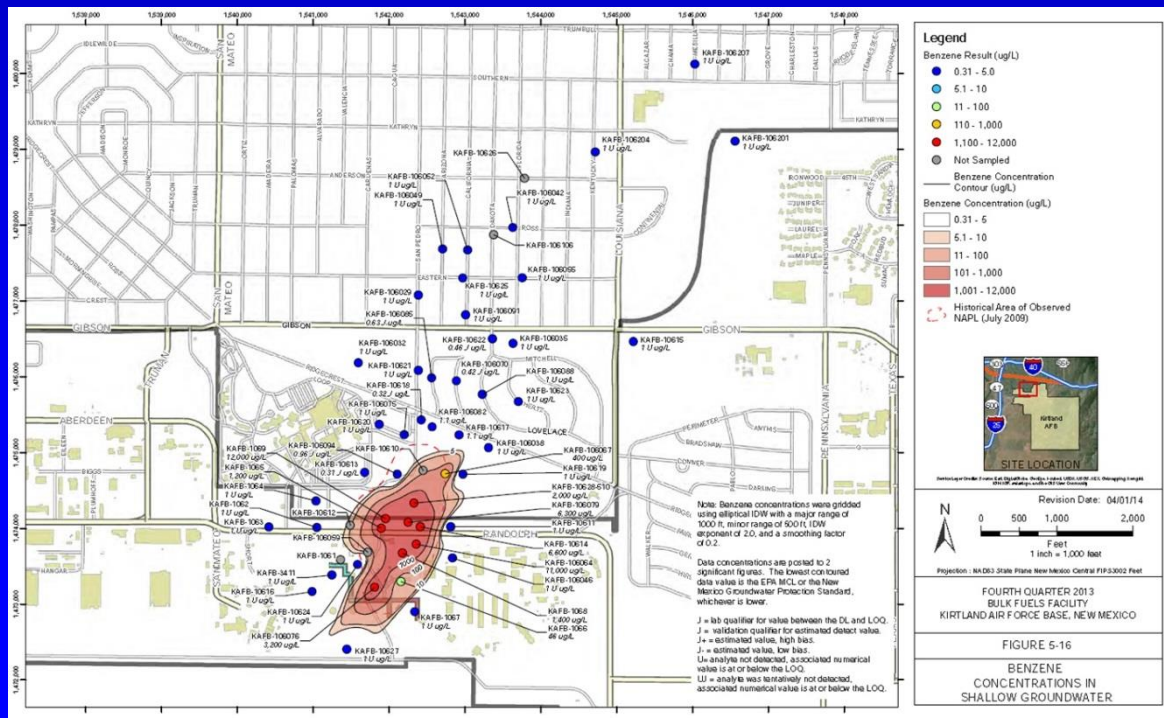


Light Non-Aqueous Phase Liquid (LNAPL)
(aviation gasoline and jet fuel)

EDB Plume



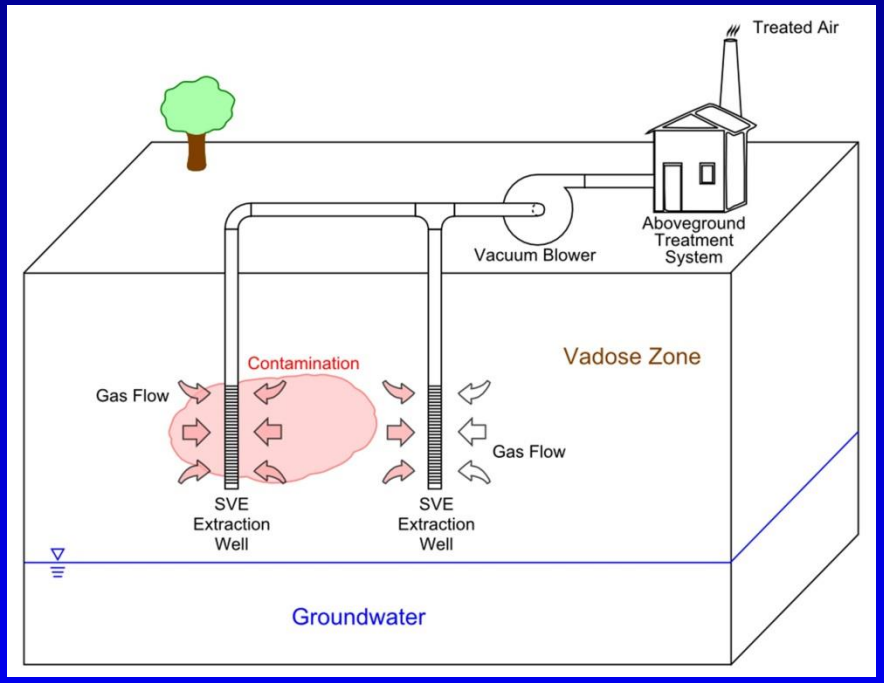
Benzene Plume Smaller than EDB Plume due to Biodegradation

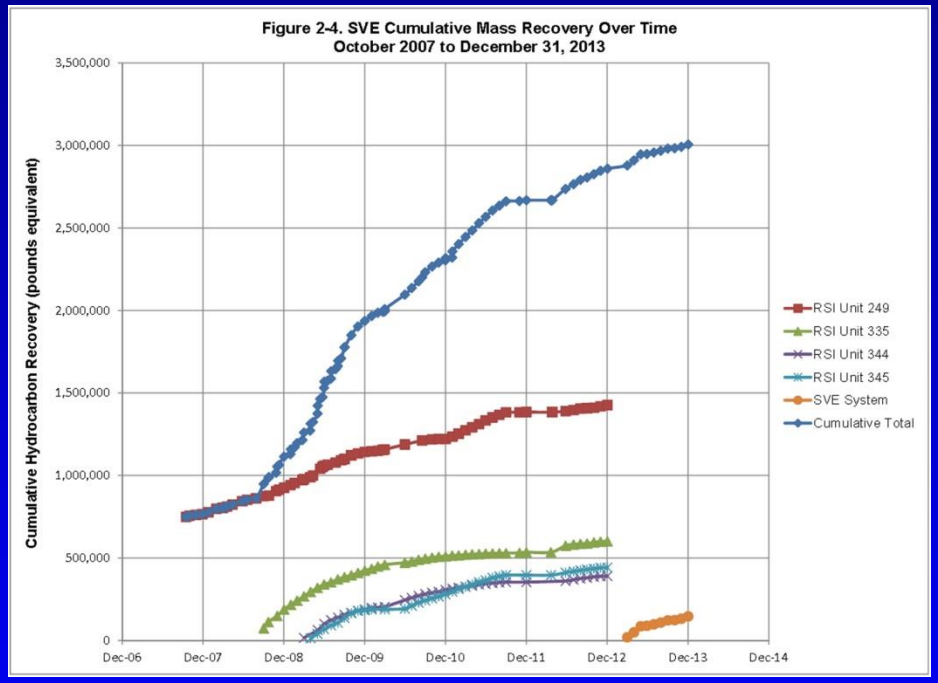


Cleanup Priorities

- **Source Control – soil vapor extraction (SVE) will vacuum fuel out of soil and prevent additional groundwater contamination**
- **LNAPL – light non-aqueous phase liquid, fuel, must be removed to prevent additional dissolved phase contamination**
- **Dissolved Phase Remediation – interim containment systems will halt plume migration and prevent contaminants from reaching supply wells; long term solution has not been selected**
- **Protect Drinking Water Wells – monthly testing; contain and halt plume migration**

Soil Vapor Extraction (SVE)

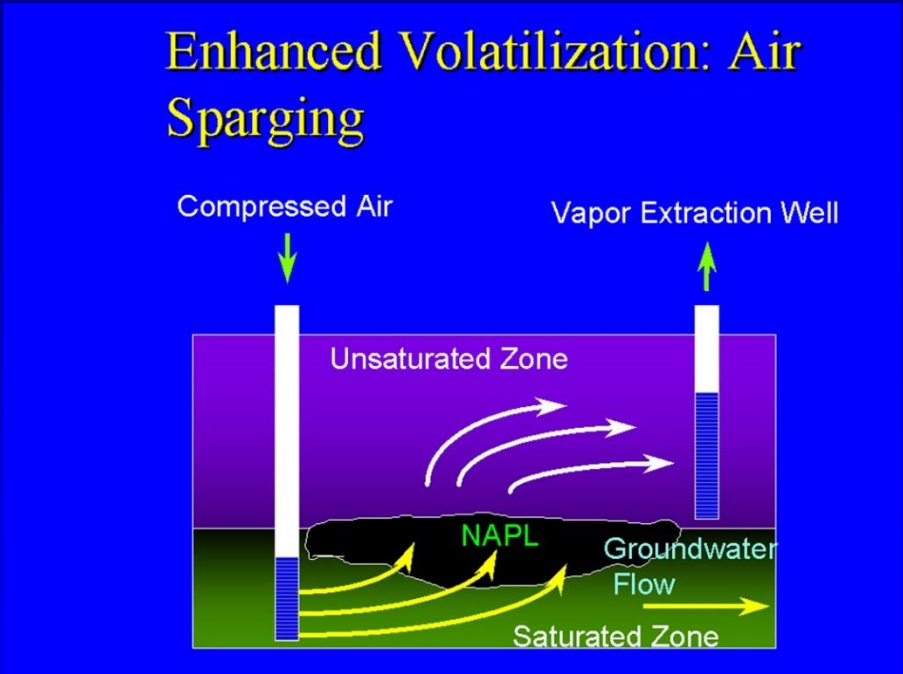


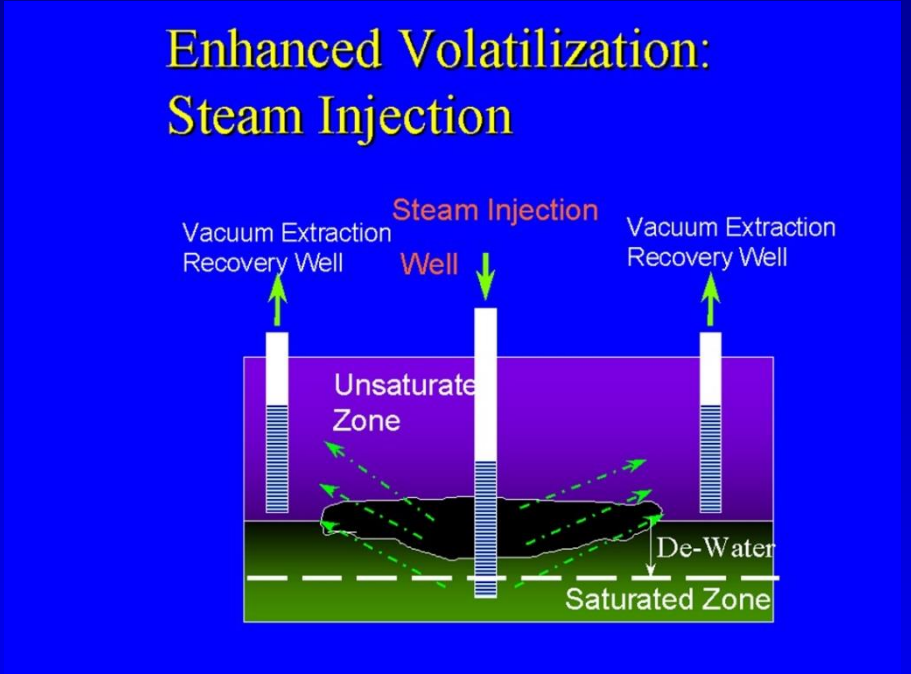


More than 500,000 gallons of fuel recovered by SVE.

Existing SVE is undersized and must be made more robust.

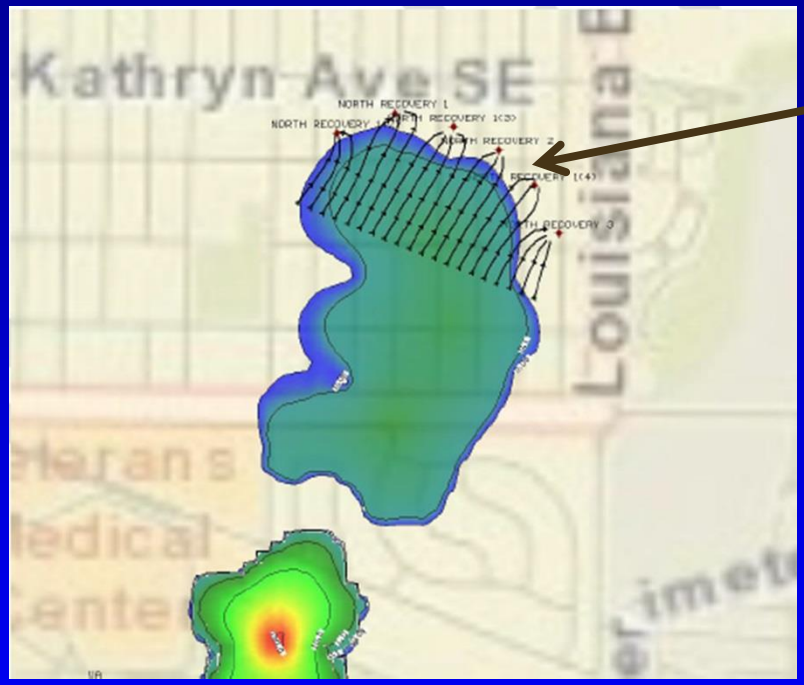
LNAPL Remediation





LNAPL that had been floating on groundwater smeared and submerged by a rising water table. Removal of the LNAPL will be a challenge.

Dissolved Phase Containment



Possible array of pumping wells to capture and contain the EDB

(from draft 2013 EPA Model Report)

Groundwater extraction pilot test is being designed.
Water pumped for containment could be treated and put to beneficial use.

Drinking Water Protection

- Water supply wells in the area are being tested monthly
- No detections of any fuel contaminants in any production well

Drinking Water Standards	EDB Concentration µg/L
EPA drinking water standard	0.05
N.M. drinking water standard	0.05

- Multiple models developed to simulate EDB migration
- Different assumptions/input parameters

EDB Arrival Dates	EPA	KAFB/CB&I	CH2MHILL	USACE
Ridgecrest 3	2083	> 2093	1: 2054, 2: no impact 3: no impact	>2063
Ridgecrest 4		> 2093		>2063
Ridgecrest 5	2044	> 2093	1: no impact; 2: 2054; 3: 2040-42	>2063
KAFB-3	2053	2058	1, 2: 2028-36; 3: 2024-32	>2063
VA Well	2014-2015	no impact	no impact	no impact

Questions?